



Product Bulletin

R&O TURBINE / HYDRAULIC OILS

BRAD PENN® R&O Turbine / Hydraulic Oils are premium rust and oxidation (R&O) inhibited multipurpose lubricating oils, formulated from high-quality base oils and a proven additive system. These products can be used as turbine oils, non-antiwear hydraulic oils, compressor oils, and non-EP gear oils.

BRAD PENN® R&O Turbine / Hydraulic Oils provide outstanding demulsibility, minimizing emulsions when coming into contact with high water content, dirt, and other contaminants. They prevent oxidation to minimize sludge and varnish formations, and impart good anti-foam characteristics. These products ensure outstanding rust and corrosion protection in the most severe operating conditions.

BRAD PENN® R&O Turbine / Hydraulic Oils are suitable for use in a wide variety of industrial applications including steam and gas turbines, air compressors, electric motors, gear reducers, machine tools, sleeve bearings, heat transfer operations, hydraulic circulating systems and vacuum pumps* (low to moderate vacuum). These products meet the following U.S. and European specifications (see "Typical Properties" chart on the reverse side for identifying the appropriate viscosity for these specifications):

- Denison HF-1
- U.S. Steel 126
- MIL-L-17672D
- DIN 51524 Part 1
- AFNOR E48-600HL
- Cincinnati Machine (P-38, P-45, P-55, P-54, and P-57)
- ASTM D 4304 Type I (ISO 32, 46, 68 and 100)

*Always consult vacuum pump Original Equipment Manufacturer (OEM) for selection of proper fluid.



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BRAD PENN[®] R&O Turbine / Hydraulic Oils - Typical Properties

ISO Viscosity Grade	Test Method	22	32	46	68	100	150	220
API Gravity, 60°F	ASTM D-4052	33.3	30.7	31.9	28.8	31.1	27.8	27.3
Density, lbs/gal (g/L)	Calculated	7.15 (857)	7.26 (869)	7.23 (866)	7.35 (880)	7.32 (877)	7.40 (889)	7.42 (891)
Viscosity, cSt @ 40°C	ASTM D-445	22.0	32.0	46.0	68.0	100.0	149.5	220.0
Viscosity, cSt @ 100°C	ASTM D-445	4.25	5.3	6.75	8.5	11.0	14.3	18.8
Viscosity, SUS @ 100°F	ASTM D-2161	115	165	238	353	521	787	1165
Viscosity, SUS @ 210°F	ASTM D-2161	40.0	44.0	48.7	54.8	65.4	76.9	95.1
Viscosity Index	ASTM D-2270	95	95	100	95	102	95	96.0
Pour Point, °F (°C)	ASTM D-5949	-5 (15) (max)	-30 (-33) (max)	-15 (-27)	-0.4 (-18) (max)	-11 (-24)	10 (-12) (max)	15 (-9) (max)
Flash Point, COC, °F (°C)	ASTM D-92	385 (196)	400 (204)	425 (218)	430 (220)	475 (246)	485 (252)	505 (263)
Color	ASTM D-1500	1.0	0.5	0.5	0.5	0.5	2.5	3.0
Foam Stability Test, ml of foam after 10 minutes of settling for all sequences	ASTM D-892	No Foam	No Foam	No Foam	No Foam	No Foam	No Foam	No Foam
Emulsion, 20 min. @ 130°F 60 min. @ 180°F	ASTM D-1401	40-37-3 ---	40-37-3 ---	40-37-3 ---	40-37-3 ---	--- 40-37-3	--- 40-37-3	--- 40-37-3
TAN	ASTM D-664	0.15	0.15	0.15	0.15	0.15	0.15	0.15
KF Moisture, ppm	ASTM D-6304	100 (max)	100 (max)	200 (max)	100 (max)	100 (max)	100 (max)	100 (max)
Rust Test	ASTM D-665 A&B	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Oxidation Stability Performance, hrs	ASTM D-943	2,500+	2,500+	3,500+	3,100+	2,500+	2,000+	2,500+
U.S. & European R&O Specifications: U.S. Steel 126 Cincinnati Machine ASTM D 4304 Type I Denison HF-1 AFNOR E48-600HL DIN 51524 Part 1 MIL-L-17672D		N/A P-45 N/A ✓ ✓ ✓ N/A	✓ P-38 ✓ ✓ ✓ ✓ ✓	✓ P-55 ✓ ✓ ✓ ✓ ✓	✓ P-54 ✓ ✓ ✓ ✓ ✓	✓ N/A ✓ ✓ ✓ ✓ N/A	✓ P-57 N/A ✓ ✓ ✓ N/A N/A	N/A N/A N/A ✓ N/A N/A N/A
Product Code		7362	7363	7364	7365	7366	7367	7368